

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization International Bureau



(43) International Publication Date  
31 March 2005 (31.03.2005)

PCT

(10) International Publication Number  
**WO 2005/029639 A1**

(51) International Patent Classification<sup>7</sup>: H01Q 1/32, 7/08, 1/22

(21) International Application Number:  
PCT/JP2004/013995

(22) International Filing Date:  
16 September 2004 (16.09.2004)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:  
2003-329695 22 September 2003 (22.09.2003) JP

(71) Applicant (for all designated States except US): ALPHAL CORPORATION [JP/JP]; 6-8, Fukaura 1-chome, Kanazawa-ku, Yokohama-shi, Kanagawa 2360004 (JP).

(72) Inventors; and

(75) Inventors/Applicants (for US only): NAKAMURA, Syuji [JP/JP]. GOTOU, Kazuhiko [JP/JP]. MINEMURA, Ryuji [JP/JP]. MIZUSHIMA, Kenji [JP/JP].

(74) Agents: MIYOSHI, Hidekazu et al.; Toranomon Daiichi Building, 9th Floor, 2-3, Toranomon 1-chome, Minato-ku, Tokyo 1050001 (JP).

(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

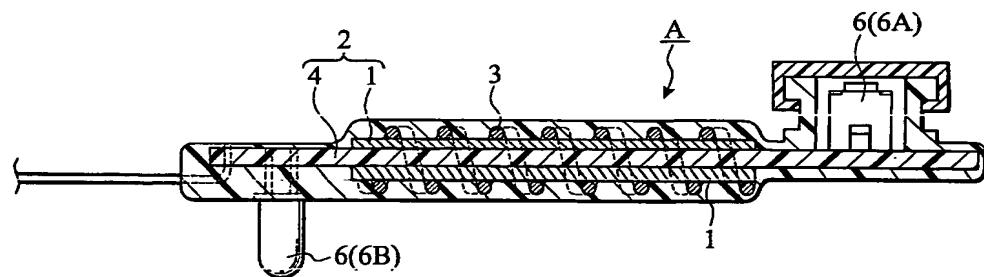
(84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:

— with international search report

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: ANTENNA APPARATUS COMPRISING A MAGNETIC CORE



WO 2005/029639 A1

(57) Abstract: An antenna apparatus of the present invention has an antenna having a core (2) around which an insulative covered conductor (3) is wound. The core has a magnetic core (1) and a wiring layer which are laminated on each other. The magnetic core (1) is made of flexible soft magnetic material. A wiring space is formed inside of the antenna apparatus. With this structure, the packing density is enhanced.